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| 08/675,280         | 07/01/96    | WEBER                 | R TI-19646.1     |

34M1/0606

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ART UNIT

PAPER NUMBER

3407

1418

DATE MAILED:  
08/06/97

This is a communication from the examiner in charge of your application.  
COMMISSIONER OF PATENTS AND TRADEMARKS

## OFFICE ACTION SUMMARY

- Responsive to communication(s) filed on 3/17/97
- This action is FINAL.

- Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 D.C. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

- Claim(s) 1-2, 5-8, 11-12 and 17-24 is/are pending in the application.  
Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- Claim(s) \_\_\_\_\_ is/are allowed.
- Claim(s) 1-2, 5-8, 11-12 and 17-24 is/are rejected.
- Claim(s) \_\_\_\_\_ is/are objected to.
- Claim(s) \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

- See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- The proposed drawing correction, filed on \_\_\_\_\_ is  approved  disapproved.
- The specification is objected to by the Examiner.
- The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

- Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- All  Some\*  None of the CERTIFIED copies of the priority documents have been
- received.
- received in Application No. (Series Code/Serial Number) \_\_\_\_\_
- received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

- Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

- Notice of Reference Cited, PTO-892
- Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_
- Interview Summary, PTO-413
- Notice of Draftsperson's Patent Drawing Review, PTO-948
- Notice of Informal Patent Application, PTO-152

-SEE OFFICE ACTION ON THE FOLLOWING PAGES-

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***Response to Amendment***

Applicant's arguments filed March 17, 1997 have been fully considered but they are not deemed to be persuasive.

Claims 1-2, 5-8, 11-12 and 17-24 are pending.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103, the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 C.F.R. § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of potential 35 U.S.C. § 102(f) or (g) prior art under 35 U.S.C. § 103.

Claims 1, 5, 7, 11, 17 and 19 are rejected under 35 U.S.C. § 103 as being unpatentable over Lebailly et al. in view of Kuzay.

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The patent of Lebailly et al., in Figures 1-3, in column 1, lines 19-35 and in column 2, line 35 through column 4, line 5, discloses epoxy resin/metal plates (1,2) defining and an enclosure/cavity and a highly thermally conductive surface region thereon. The enclosure comprises thermally conductive (aluminum, sintered metal, fibre flock), fibrous, porous material (5) homogeneously disposed within a phase change liquid and located within the cavity. The patent of Lebailly et al. fails to disclose the thermally conductive fibers being graphite and extending from the thermally conductive surface of the epoxy resin plates.

The patent of Kuzay, in Figures 1-3 and 5, in column 2, lines 40-58 and in column 3, lines 20-68, discloses a (silicon carbide) porous material (12) bonded to and externally extending from a thermally conductive surface (11,24) and homogeneously disposed within a cavity for the purpose of constantly channelling heat from the conductive surface to a phase change fluid. The limitation of the fibers claimed in claims 17 and 19 being graphite is considered to be an obvious design expedient in view of the recitation by Kuzay, in column 3, lines 20-23, "Porous material 12 is ... silicon carbide (SiC)", since graphite is a form of heated carbon, which does not solve any stated problem or produce any new and/or unexpected result. It would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to employ in Lebailly et al. a silicon carbide porous material bonded to and externally extending from the thermally conductive surface for the purpose of constantly channelling heat from the conductive surface to the phase change fluid as disclosed in Kuzay. Regarding claim 1, the fibers being bonded to and externally extending from the plate (1) as disclosed by the device of the combination of Lebailly et al. and Kuzay is read as a "matrix". Regarding claims 7 and 11, the porous material is considered to be homogeneously disposed within the cavity as illustrated in Figure 3 of Lebailly et al. and as illustrated in Figures 1-2 of Kuzay. The remaining limitations are considered to be clearly met.

Claims 2, 6, 8, 12, 18 and 20-24 are rejected under 35 U.S.C. § 103 as being unpatentable over Lebailly et al. in view of Kuzay as applied to claims 1, 5, 7, 11, 17 and 19 above, and further in view of Hermanns et al. The patent of Lebailly et al. as modified, discloses all the claimed features of the invention with the exception of the phase change material being a wax.

The patent of Hermanns et al., in Figures 1a-3b, in column 1, lines 27-29, in column 3, lines 25-29 and in column 4, lines 22-31, discloses a solid to liquid phase change material, such as a paraffin wax (1,1b), filled within an enclosed cavity for the purpose of uniformly transferring heat. It would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to employ in Lebailly et al. as modified, the phase change material being a wax for the purpose of uniformly transferring heat as disclosed in Hermanns et al. Regarding claims 8 and 12, the porous material is considered to be homogeneously disposed in the cavity as illustrated in Figure 3 of Lebailly et al. and as illustrated in Figures 1-2 of Kuzay.

**Response to Arguments**

Applicant's concerns directed toward the prior art not teaching or suggesting an enclosure having a composite of highly thermally conductive fibers disposed to provide a matrix are not well taken. Lebailly et al. discloses epoxy resin/metal plates defining an enclosure/cavity and having a highly thermally conductive surface region thereon. The enclosure comprises a thermally conductive (aluminum, sintered metal, **fibre** flock), **fibrous**, porous material homogeneously disposed within a phase change liquid and located within the cavity. Kuzay discloses a (silicon carbide) porous material bonded to and externally extending from a thermally conductive surface and homogeneously disposed within a cavity for the purpose of constantly channelling heat from the conductive surface to a phase change fluid. Therefore, the device of the combination of Lebailly et al. and Kuzay includes bonding highly thermally conductive fibers to a thermally conductive plate where the fibers extend into an enclosure/cavity for the purpose of constantly channelling heat

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from the conductive surface of the plate to a phase change fluid located within the enclosure/cavity. The fibers bonded to (thermally coupled; integral with) the thermally conductive epoxy resin plate is read as a "matrix". The fibers being graphite as claimed in claims 17 and 19, are considered to be an obvious design expedient in view of the recitation by Kuzay "Porous material 12 is ... silicon carbide (SiC)" in column 3, lines 20-23, since graphite is a form of heated carbon, which does not solve any stated problem or produce any new and/or unexpected result. Furthermore, the recitation in Lebailly et al. in column 4, lines 3-6, "The porous metallic material may consist of ... aluminum" is considered to meet claim 5, aluminum porous material.

Applicant's statement that no such combination is taught or suggested by the cited reference is not well taken. Hermanns et al. teach a solid to liquid phase change material, such as a paraffin wax, filled within an enclosed cavity for the purpose of uniformly transferring heat.

#### ***Conclusion***

Applicant's amendment necessitated the new grounds of rejection. Accordingly, **THIS ACTION IS MADE FINAL.** See M.P.E.P. § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 C.F.R. § 1.136(a).

A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS FINAL ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS

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ACTION. IN THE EVENT A FIRST RESPONSE IS FILED WITHIN TWO MONTHS OF THE MAILING DATE OF THIS FINAL ACTION AND THE ADVISORY ACTION IS NOT MAILED UNTIL AFTER THE END OF THE THREE-MONTH SHORTENED STATUTORY PERIOD, THEN THE SHORTENED STATUTORY PERIOD WILL EXPIRE ON THE DATE THE ADVISORY ACTION IS MAILED, AND ANY EXTENSION FEE PURSUANT TO 37 C.F.R. § 1.136(a) WILL BE CALCULATED FROM THE MAILING DATE OF THE ADVISORY ACTION. IN NO EVENT WILL THE STATUTORY PERIOD FOR RESPONSE EXPIRE LATER THAN SIX MONTHS FROM THE DATE OF THIS FINAL ACTION.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Atkinson whose telephone number is (703) 308-2603 (FAX (703) 308-7765).

C.A.  
C.A.  
June 3, 1997

  
**JOHN RIVELL**  
**PRIMARY EXAMINER**  
**ART UNIT 347**